

Year 9 Curriculum Intent 2020-21

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	Probability, Geometry & Algebra	Statistics, Number, Geometry & Algebra	Number, Geometry & Ratio	Number, Geometry & Statistics	Statistics, Algebra & Ratio	Geometry & Probability
Knowledge & Understanding (<i>National Curriculum</i>)	<p>Pupils can record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale understand that the probabilities of all possible outcomes sum to 1 Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.</p> <p>work with coordinates in all four quadrants recognise, sketch and produce graphs of linear functions of one</p>	<p>Pupils can describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)</p> <p>use standard units of mass, length, time, money and other measures, including with decimal quantities change freely between related standard units [for example time, length, area, volume/capacity, mass]</p> <p>use the concepts and vocabulary of prime factorisation, including</p>	<p>Pupils can round numbers and measures to an appropriate degree of accuracy use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a < x \leq b$ apply and interpret limits of accuracy when rounding or truncating, (including upper and lower bounds (KS4C))</p> <p>calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes derive and apply formulae to calculate and solve problems involving other prisms (including cylinders)</p>	<p>Pupils can appropriate tables, charts, and diagrams, including pie charts describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs.</p> <p>draw and measure line segments and angles in geometric figures, including interpreting scale drawings derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line</p>	<p>Pupils can describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)</p> <p>generate and find the nth term of linear sequences including decreasing sequences and sequences with fractional/decimal increments recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane</p>	<p>Pupils can construct similar shapes by enlargement, by positive and fractional integer scale factors, as well as negative integer scale factors with and without coordinate grids, as well as accurately combining multiple transformations (rotations, translations and reflections) apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems</p>

	<p>variable with appropriate scaling, using equations in x and y and the Cartesian plane interpret mathematical relationships both algebraically and graphically</p> <p>describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric use the standard conventions for labelling the sides and angles of triangle ABC identify properties of, and describe the results of, translations, rotations and reflections applied to given figures construct similar shapes by enlargement, by positive integer scale factors with and without coordinate grids use scale factors</p>	<p>using product notation and the unique factorisation property calculate with numbers in standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer (KS4C)</p> <p>derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides</p> <p>understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors understand and use standard mathematical formulae; rearrange formulae to change the subject expanding products of two or more binomials</p>	<p>use ratio notation, including reduction to the form 1:n and n:1 express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction use compound units such as speed, unit pricing and density to solve problems.</p>	<p>as the shortest distance to the line</p> <p>solve problems involving percentage change including original value problems and compound interest in financial mathematics continue to interpret fractions and percentages as operators</p>	<p>reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically</p> <p>solve problems involving direct and inverse proportion, including graphical and algebraic representations</p>	<p>involving right-angled triangles</p> <p>enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams generate theoretical <u>tree diagrams</u> for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.</p>
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Assessment	Teacher/Ass. test	9.1 EXAM	Teacher/Ass. test	9.2 EXAM	Teacher/Ass. test	9.3 EXAM (GCSE)
Why this? Why now?	<p>Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programme of study for key stage 3 is organised into apparently distinct domains, but pupils should build on key stage 2 and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge in science, geography, computing and other subjects. The structure is designed to bridge between KS2 and KS4, building both within and between key topic areas. The structure also builds the complexity levels within topics and gives a greater variation in the challenge given to pupils.</p>					
Skills & Characteristics	<p>Resilience Pupils will increase their resilience during the course through learning new concepts, using prior knowledge to develop mathematical fluency and applying skills to a variety of situations and problems. Pupils will be challenged in all lessons and will show that they have learned from mistakes through a variety of tasks including connect exercises. The challenge activities will have the aim of developing both skills and high aspirations in both this subject and life beyond. Resilience will also be developed within the Key maths skills below (fluency, reasoning and problem solving).</p> <p>Collaboration Pupils will be given the opportunity to work together to develop and share their ideas on topics, discuss misconceptions and how these topics can be used in real-life situations.</p> <p>Creativity Pupils will develop creativity through a variety of problem solving activities within each topic, working on independent tasks beyond the classroom such as Mangahigh activities, and apply the key skills (fluency, reasoning and problem solving).</p> <p>Key stage 3 Develop fluency</p> <ul style="list-style-type: none"> ▪consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots ▪select and use appropriate calculation strategies to solve increasingly complex problems ▪use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships ▪substitute values in expressions, rearrange and simplify expressions, and solve equations ▪move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs] ▪develop algebraic and graphical fluency, including understanding linear and simple quadratic functions ▪use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics. 					

	<p>Reason mathematically</p> <ul style="list-style-type: none"> ▪extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations ▪extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically ▪identify variables and express relations between variables algebraically and graphically ▪make and test conjectures about patterns and relationships; look for proofs or counter- examples ▪begin to reason deductively in geometry, number and algebra, including using geometrical constructions ▪interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning ▪explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally. <p>Solve problems</p> <ul style="list-style-type: none"> ▪develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems ▪develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics ▪begin to model situations mathematically and express the results using a range of formal mathematical representations ▪select appropriate concepts, methods and techniques to apply to unfamiliar and non- routine problems.
<p>Aspirations & Careers</p>	<p>All pupils should be numerate and able to use mathematics at both work and in everyday life beyond school. Mathematics is fundamental to future success and closely linked with financial success. It enhances their ability to infer, problem solve, think logically, spot patterns as well as navigate through their chosen career with a well-equipped vocabulary. Furthermore, mathematics empowers our pupils to operate in the modern world.</p> <p>CEIAG AMSP days Careers Fairs Career themed lessons Finance lessons</p> <p>Cultural Capital Maths challenges Mangahigh challenges Mathematics in the real world Organising trips, days out and other events</p> <p>Extracurricular</p>

	Stretch and challenge club Chess & games club
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